



COMPONENTS FAQ

Q Your graphics card reviews often mention the number of pixel pipelines a card has. What is a pixel pipeline, and is it better to have more pipelines or fewer?

A When your graphics card displays an image on your computer screen, that image is made up of thousands of tiny dots known as pixels. To generate a realistic image, the graphics card applies techniques such as shading, textures and anti-aliasing to each pixel, and this takes up a lot of processing time.

To apply these effects, each pixel is passed through a pipeline, which is a little like a production line for pixels. At one end a pixel is fed in. The pipeline performs the necessary operations to produce the 3D image and spits the pixel out of the other end. The more pixel pipelines a product has, the more pixels it can deal with simultaneously, so the quicker the output and the faster the graphics. For example, nVidia's GeForce 7800 GTX has 24 pixel pipelines, while ATI's X1900 XT has 48.

Having more pixel pipelines doesn't just mean faster graphics. The processing power can be used for higher resolutions and generating more realistic scenes, too.

It's not just the number of pipelines that affects graphics performance, though. The speed of the graphics chip, the speed and size of the onboard memory and the card's overall efficiency make a big difference too.

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REVIEW MOTHERBOARD

ECS KN2 Extreme SLI

RATING ★★★★★

PRICE £115 inc VAT

SUPPLIER www.pcnextday.co.uk

DETAILS www.ecs.uk.com



ECS's KN2 Extreme SLI motherboard is an updated version of the ECS KN1 Extreme (see *Hotlist* opposite). The main difference is that the KN2 uses nVidia's new nForce 4 x16 chipset, which enables the two PCI-E x16 slots to run at x16 speeds in SLI mode. With the previous chipset, both slots slowed to x8 speed when running in SLI mode.

Given the extra bandwidth, the KN2 should perform better in SLI mode, but we didn't notice any difference in our tests. With an AMD Athlon 64 3500+ processor, 512MB of DDR memory in a dual-channel configuration and two 256MB GeForce 7800 GTX graphics cards, the KN2 scored 94.2fps in Doom 3 at a resolution of 1,600x1,200 in SLI mode. This is what we'd expect from other SLI PCs we've tested. The problem is that the cards don't use enough bandwidth to need both PCI-E x16 lanes. According to nVidia, using two 512MB cards makes a bigger difference. As graphics cards get faster and nVidia releases yet another generation of cards, though, you can expect the two x16 lanes to have a greater impact.

Support for the dual PCI-E x16 lanes comes from nVidia's new SPP 100 Northbridge. ECS has installed this on its Duo N riser card, which plugs into the motherboard's SDGE slot. This slot spans almost the entire motherboard, so you have to apply a lot of force to install the Duo N card.

The idea behind this card is that you can swap it to support different technologies. However, ECS has released no details of uses for this slot and whether this motherboard will support competing

dual-slot technology such as CrossFire. We think it's a strange step to take. Installing the Northbridge on a riser card is more likely to limit performance compared with an integrated chip, and the Duo N card also airflow across the board.

The KN2 scored 120 in *Shopper's* application benchmarks. This is competent, but the KN1 Extreme scored 127. We would have liked the KN2 to keep pace with the previous generation. Otherwise, it's business as usual. The board has two PCI and one PCI-E x1 slot for further expansion, although using the KN2 in SLI mode blocks the PCI-E x1 slot. ECS supplies this board with its Top Hat Flash. This additional BIOS clips on top of the board's BIOS, so you can restore settings in the event of a problem or overclocking mishap.

The KN2 Extreme SLI is very good value for new technology, but the Duo N card is obstructive, and there's little need for the two PCI-E x16 lanes. We'd rather save money with the KN1 Extreme.

David Ludlow



Well-priced for new technology; well-populated motherboard



Duo N board takes up a lot of room; performance not as good as we'd have liked

SPECIFICATIONS nForce 4 x16 SLI chipset, supports AMD Socket 939 processors, two PCI, one PCI-E x1, two PCI-E x16, four DIMM slots, two Gigabit Ethernet LAN, ECS Top Hat Flash, three IDE, six SATA, four USB2, FireWire (on included blanking plate). **Part code** KN2 SLI

HOTLIST PROCESSOR

AMD Athlon 64 3200+

RATING ★★★★★

PRICE £109 inc VAT

SUPPLIER www.savastore.com

DETAILS www.amd.com

AMD's Athlon 64 3200+ is a powerful and relatively cheap processor, and did well in all our benchmarks. It should appeal to overclockers, too, because AMD processors are easy to tweak. The Athlon 64 3200+ is also an excellent choice for games and should help your PC muster a few more frames per second.

SPECIFICATIONS 2.6GHz processor, Socket 939, 200MHz external bus, two 1,000MHz HyperTransport, 128KB L2 cache, 512KB L1 cache. **Part code** ADA3200BPBOX



HOTLIST PROCESSOR

INTEL Pentium 4 640

RATING ★★★★★

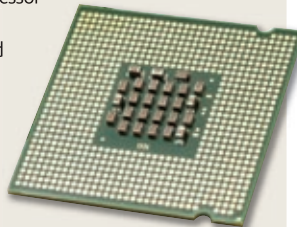
PRICE £141 inc VAT

SUPPLIER www.savastore.com

DETAILS www.intel.com

Intel's 640 processor supports 64-bit instructions and has a massive 2MB of L1 cache. The Pentium 4 640 is a high-performance chip that provides enough power to cope with any application. It did well in our benchmarks and is good value, too.

SPECIFICATIONS 3.26GHz processor, LGA775, 800MHz external bus, 16KB L2 cache, 2,048KB L1 cache. **Part code** BX80547PG3200F



HOTLIST PROCESSOR

INTEL Celeron D 346

RATING ★★★★★

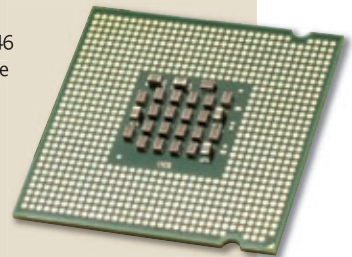
PRICE £77 inc VAT

SUPPLIER www.dabs.com

DETAILS www.intel.com

Intel's Celeron D 346 might be part of the company's budget range, but it's still a good performer. It supports 64-bit instructions, which will be useful when more 64-bit applications are available. It does well with current software, too. It's a powerful budget processor with enough processing power for video editing.

SPECIFICATIONS 3.06GHz processor, LGA775, 533MHz external bus, 16KB L2 cache, 256KB L1 cache. **Part code** BX80547RE3066CN





REVIEW GRAPHICS CARD

EVGA e-GeForce 7800 GT

RATING ★★★★★

PRICE £222 inc VAT

SUPPLIER www.scan.co.ukDETAILS www.evga.com

You've probably never heard of eVGA before, but the company is a large nVidia partner in the US and has just launched in the UK. We've got hold of the company's e-GeForce 7800 GT, which uses nVidia's GeForce 7800 GT graphics chip.

This isn't just another reference design, though, as eVGA has overclocked its card. The typical reference core speed is 400MHz, but the e-GeForce has a core speed of 470MHz. The 256MB of GDDR3 has also been overclocked from 500MHz on the

reference card to 550MHz (1.1GHz effective) on eVGA's card. These specifications make the e-GeForce 7800 GT slightly faster than a reference nVidia 7800 GTX card. However, the 7800 GT has just 20 pixel pipelines rather than the 24 featured in the 7800 GTX (see the FAQ, left).

In our tests, the e-GeForce 7800 GT outperformed the reference 7800 GTX. At our standard 1,024x768 resolution, the 7800 GT produced 114.9fps in Doom 3 and scored 15,712 in

3DMark03. This card is designed to take advantage of high resolutions, and it doesn't disappoint. Running at 1,600x1,200, it got scores of 91.7fps in Doom 3 and 6,617 in 3DMark03. These are just ahead of the 7800 GTX, but are very impressive considering that this card is almost £100 cheaper.

You don't get much else in the box, except a couple of demos for photo-editing packages. Even so, this is the best 7800 GT graphics card we've seen and the best value high-end graphics card you can buy.

David Ludlow

✓ Faster than a reference 7800 GTX; great value

✗ Poor software bundle

SPECIFICATIONS nVidia GeForce 7800 GT graphics, 470MHz core, 256MB GDDR3 RAM running at 550MHz (1.1GHz effective), 2x DVI and S-video outputs. **Part code** LN12633

REVIEW GRAPHICS CARD

GE CUBE X1600XT

RATING ★★★★★

PRICE £119 inc VAT

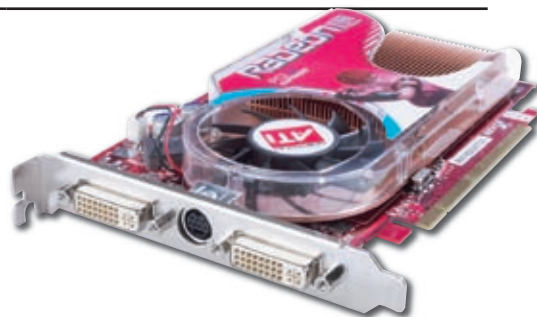
SUPPLIER www.lowestonweb.comDETAILS www.gecube.com

ATI has released the Radeon X1600XT chip, and this GeCube is the first card we've seen to use it. The card fits in the middle of ATI's new range between the X1900 at the top and the X1300 at the bottom. Unlike the previous-generation X800GTO, the X1600XT supports CrossFire, for dual-card configurations, and Shader model 3.0, which more games are using to produce realistic graphics.

GeCube's X1600XT has 12 pixel pipelines, a core speed of 600MHz and 256MB of GDDR3 RAM running at 700MHz (1.4GHz effective). On paper, it's fast and outstrips the similarly priced X800GTO. Performance in 3DMark03, which uses DirectX, was very good, and it scored 9,387 at 1,024x768. Upping the resolution to 1,280x1,024 produced a score of 4,544. In both cases, the X1600XT almost doubled the scores from nVidia's similarly priced GeForce 6600GT cards. Performance in Doom 3 was also good, but a little off nVidia's pace. Doom 3 uses OpenGL for its graphics, and ATI's OpenGL support isn't as good as nVidia's. Even so, the X1600XT managed 43.2fps at 1,024x768 with 4x FSAA and 30.3fps at 1,280x1,024.

This very well-priced mid-range card can cope with all the latest games. However, OpenGL performance could be better.

David Ludlow



✓ Good performance; supports Shader model 3.0

✗ OpenGL performance could be better

SPECIFICATIONS ATI Radeon X1600XT graphics, 600MHz core speed, 256MB GDDR3 RAM running at 700MHz (1.4GHz effective), VGA, DVI and S-video outputs. **Part code** GC-RX1600XTG3-D3

HOTLIST SILENT PC CASE

ANTEC P150

RATING ★★★★★

PRICE £102 inc VAT

SUPPLIER www.morecomputers.comDETAILS www.antec.com

Antec's steel, iPod-white P150 case looks great on the desk and is built to keep your PC silent. It doesn't rattle, it has acoustic insulation and the hard disks screw into rubber grommets to prevent vibrations echoing through the P150. A silent Antec Neo HE 430W modular power supply is also included, all of which makes this case excellent value.



SPECIFICATIONS ATX case, 120mm fan, two USB2, one FireWire, two audio, two 5¼" drive bays, one external 3½" drive bay, four internal 3½" drive bays. **Part code** 0761345-019151-0

HOTLIST POWER SUPPLY

ENERMAX Liberty ELT500AWT

RATING ★★★★★

PRICE £75 inc VAT

SUPPLIER www.candcentral.co.ukDETAILS www.enermax.co.uk

Enermax's Liberty ELT500AWT is a modular 500W SLI-certified power supply. While it has enough power for a PC stuffed full of components and drives, you have to fit only the power cables you need. It's well priced, comes with a carry bag for your spare cables and is silent in operation.



SPECIFICATIONS 500W modular power supply, five modular ports, two PCI-E, six Molex, four SATA. **Part code** 0761345-05506-2

HOTLIST MOTHERBOARD

ECS KN1 SLI Extreme

RATING ★★★★★

PRICE £77 inc VAT

SUPPLIER www.pcnextday.co.ukDETAILS www.ecs.uk.com

ECS's KN1 SLI Extreme motherboard uses nVidia's nForce 4 SLI chipset, so you can use two graphics cards together. It also supports all Socket 939 Athlon 64 processors – ideal as the basis of a powerful computer.

Performance is excellent, and the motherboard has every port you could possibly want. For the price, this is excellent value.



SPECIFICATIONS nForce 4 SLI chipset, supports AMD Socket 939 processors, three PCI, one PCI-E x16, one PCI-E x1, four DIMM slots, two Gigabit Ethernet, ECS Top Hat Flash, three IDE, six SATA2, four USB2, FireWire. **Part code** KN1 SLI